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PATENT & TRADEMARK OFFICE
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FIG. 1

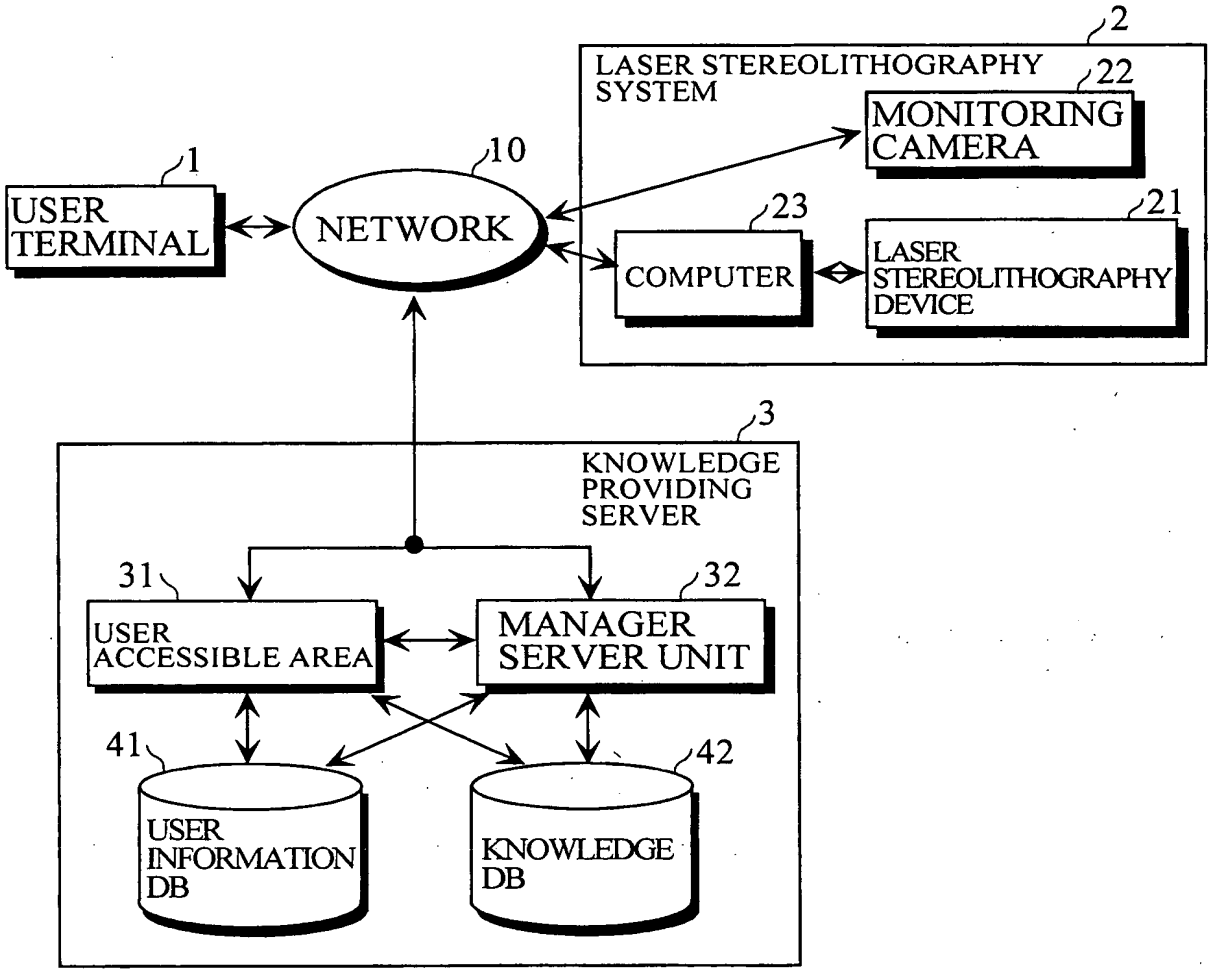


FIG.2

CHAPTER	CLAUSE	TITLE OF CLAUSE	CONTENTS OF WORK	DEMAND	PRECONDITIONS OF KNOW-HOW	KNOW-HOW	UNDESIRABLE RESULTS IN CASE WHERE KNOW-HOW IS NOT USED	REASONS WHY UNDESIRABLE RESULTS OCCUR (CAUSE OF UNDESIRABLE RESULTS)	KNOWLEDGE AND WISDOM RELATED TO KNOW-HOW TO BE USED	FUNDAMENTAL CAUSE	KEYWORD	FIGURE 1	FIGURE 2
Chap 0	0_01												
Chap 1	1_01												
Chap 1	1_02												
Chap 2	2_01	Determine a reverse surface	Turn up an important surface of a molded object	Appearance	In a case where the number of surfaces whose appearances are given importance to is only one, and the surface is a flat surface	Turn a surface whose appearance is given importance to directly upward	Becomes a surface on which steps are noticeable	Because steps corresponding to stacked layers are formed like contours	Resolution in the Z direction exerts an effect	Because a molding method is one carried out by stacking layers	Directional steps	Model photograph	
Chap 2	2_02												
Chap 2	2_03												
Chap 2	2_04												
Chap 3	3_01												
⋮	⋮												

FIG. 3

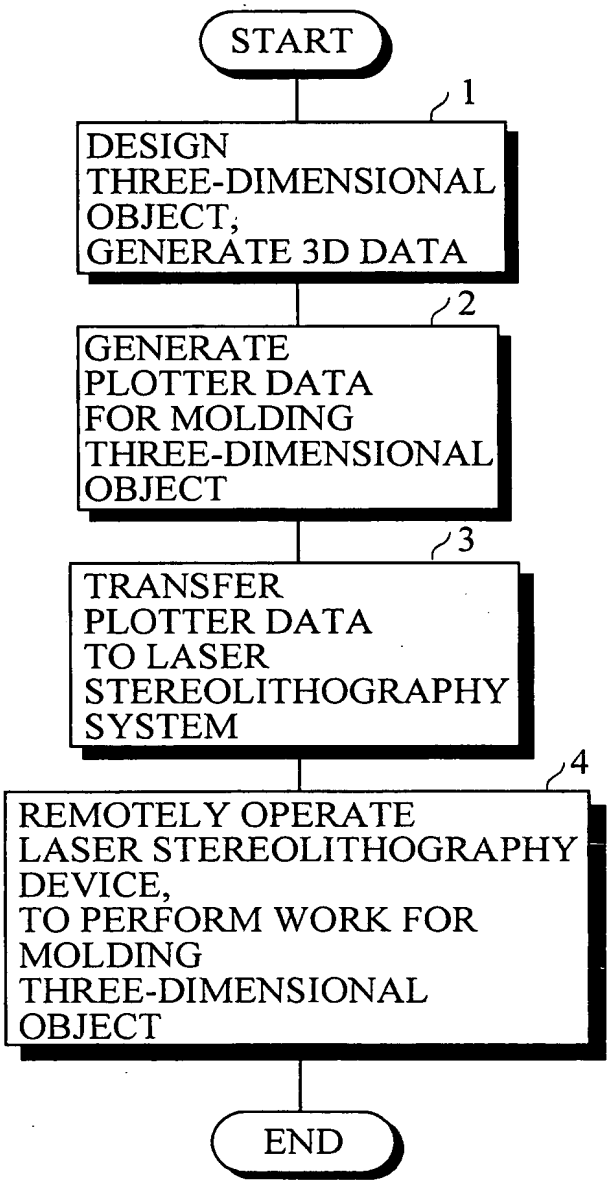

START
1
DESIGN THREE-DIMENSIONAL OBJECT; GENERATE 3D DATA
2
GENERATE PLOTTER DATA FOR MOLDING THREE-DIMENSIONAL OBJECT
3
TRANSFER PLOTTER DATA TO LASER STEREOLITHOGRAPHY SYSTEM
4
REMOTELY OPERATE LASER STEREOLITHOGRAPHY DEVICE, TO PERFORM WORK FOR MOLDING THREE-DIMENSIONAL OBJECT
END

FIG. 4

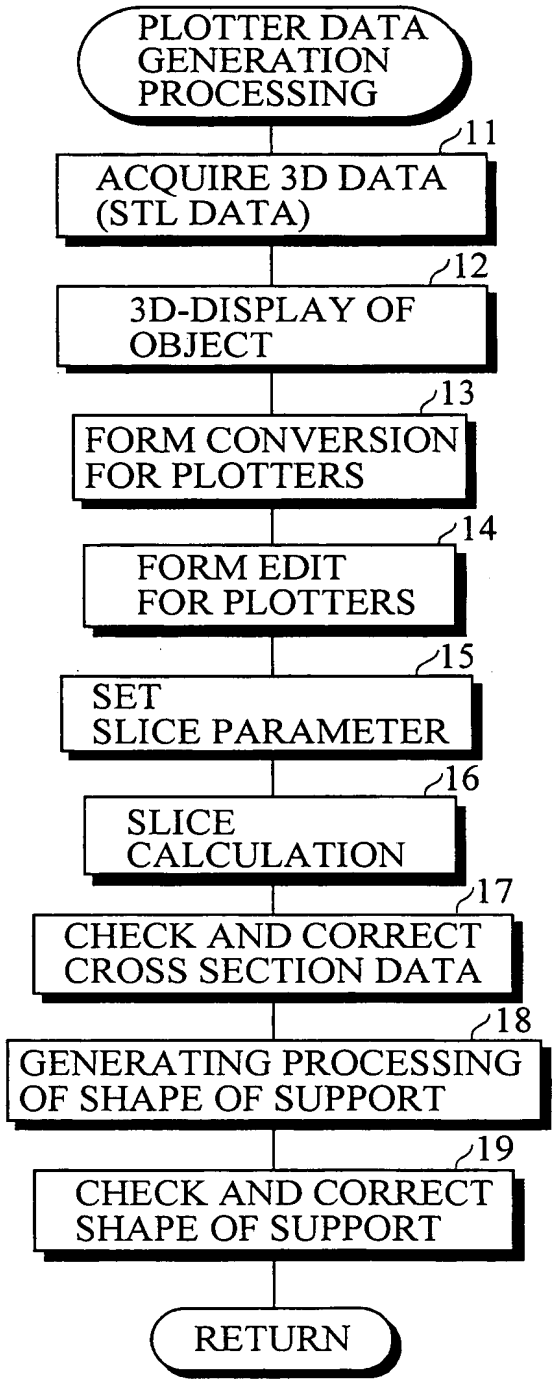

PLOTTER DATA GENERATION PROCESSING
11
ACQUIRE 3D DATA (STL DATA)
12
3D-DISPLAY OF OBJECT
13
FORM CONVERSION FOR PLOTTERS
14
FORM EDIT FOR PLOTTERS
15
SET SLICE PARAMETER
16
SLICE CALCULATION
17
CHECK AND CORRECT CROSS SECTION DATA
18
GENERATING PROCESSING OF SHAPE OF SUPPORT
19
CHECK AND CORRECT SHAPE OF SUPPORT
RETURN

FIG.5

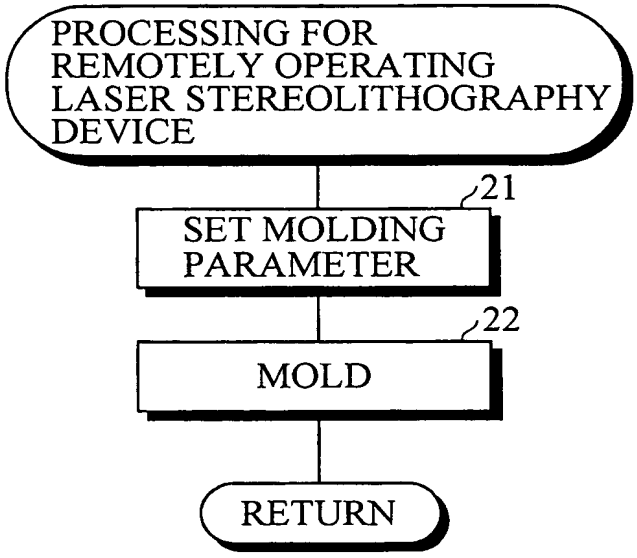

PROCESSING FOR REMOTELY OPERATING LASER STEREOLITHOGRAPHY DEVICE
21
SET MOLDING PARAMETER
22
MOLD
RETURN

FIG.6

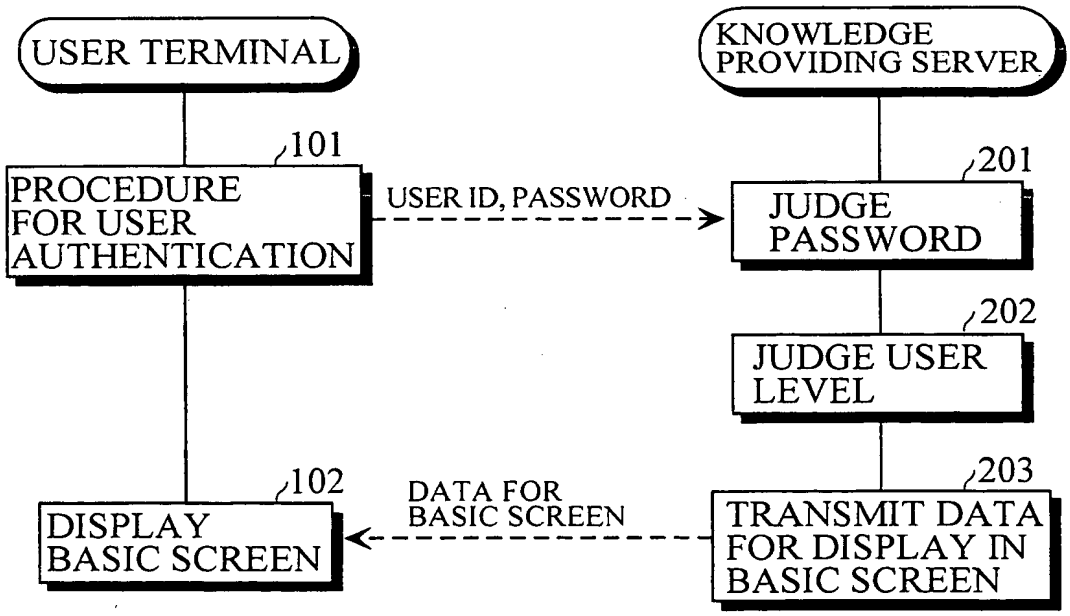

USER TERMINAL
KNOWLEDGE PROVIDING SERVER
101
PROCEDURE FOR USER AUTHENTICATION
USER ID, PASSWORD
201
JUDGE PASSWORD
202
JUDGE USER LEVEL
102
DISPLAY BASIC SCREEN
DATA FOR BASIC SCREEN
203
TRANSMIT DATA FOR DISPLAY IN BASIC SCREEN

FIG.7

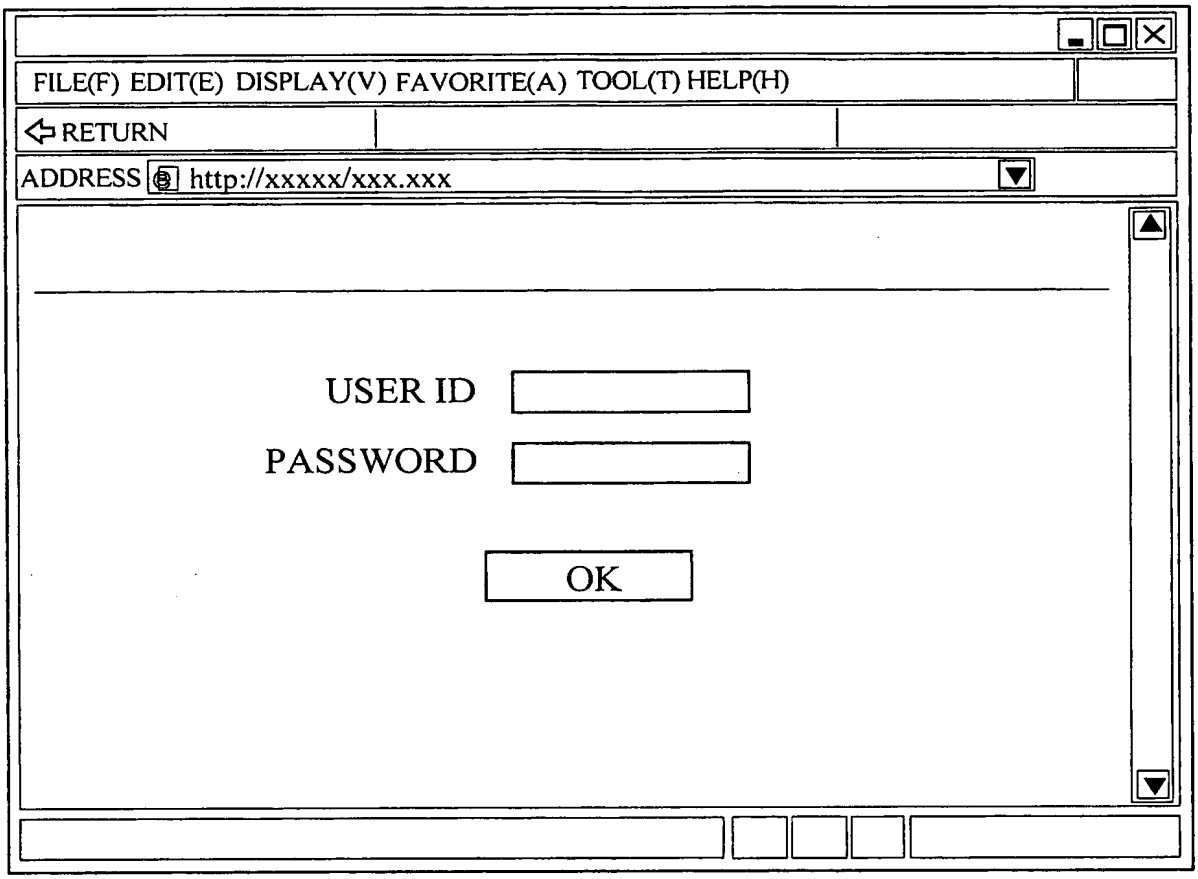

FILE(F) EDIT(E) DISPLAY(V) FAVORITE(A) TOOL(T) HELP(H)
RETURN
ADDRESS http://xxxxx/xxx.xxx
USER ID
PASSWORD
OK

FIG.8

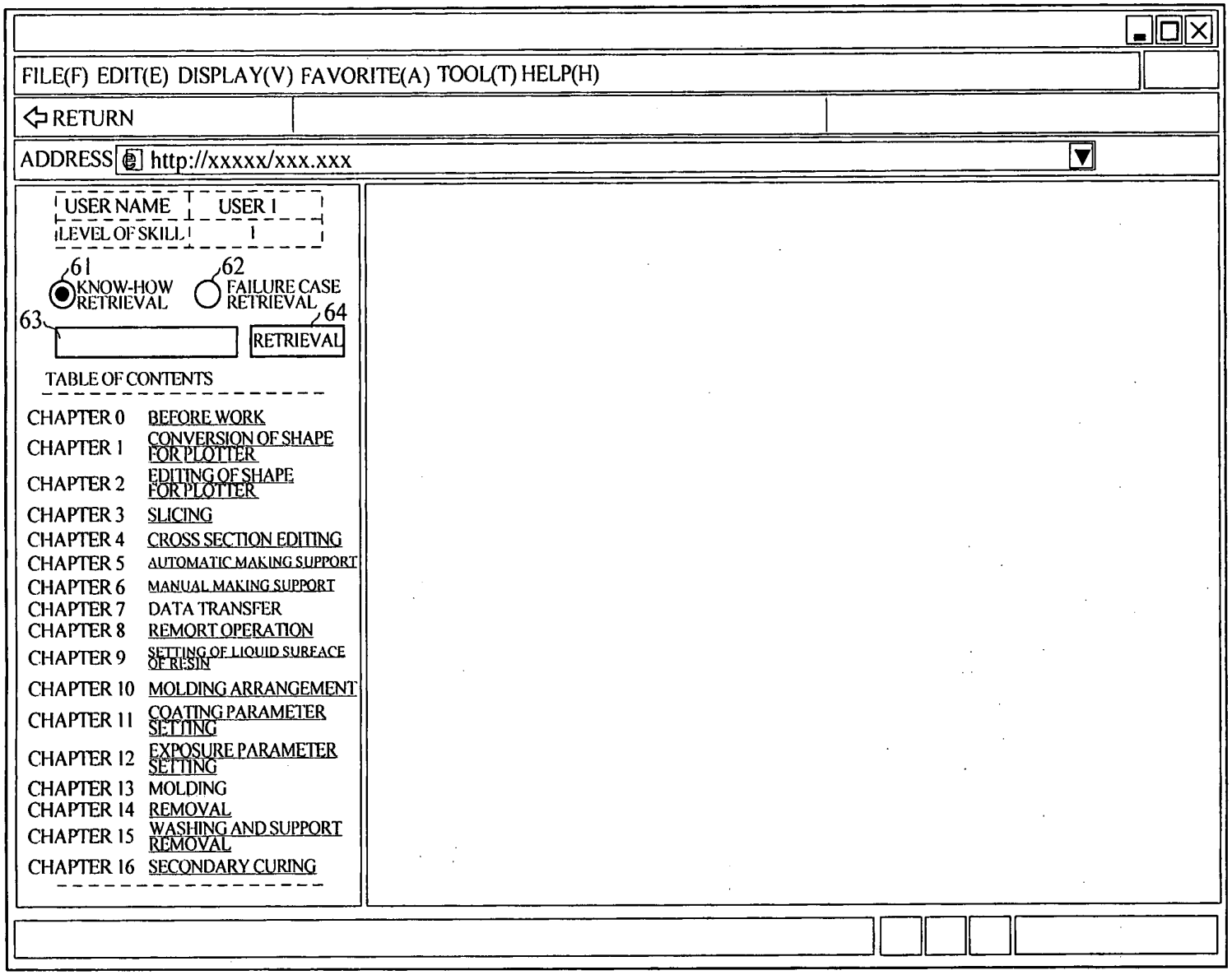

FILE(F) EDIT(E) DISPLAY(V) FAVORITE(A) TOOL(T) HELP(H)
RETURN
ADDRESS http://xxxxx/xxx.xxx
USER NAME
USER 1
LEVEL OF SKILL
1
61
KNOW-HOW RETRIEVAL
62
FAILURE CASE RETRIEVAL
63
64
RETRIEVAL
TABLE OF CONTENTS
CHAPTER 0 BEFORE WORK
CHAPTER 1 CONVERSION OF SHAPE FOR PLOTTER
CHAPTER 2 EDITING OF SHAPE FOR PLOTTER
CHAPTER 3 SLICING
CHAPTER 4 CROSS SECTION EDITING
CHAPTER 5 AUTOMATIC MAKING SUPPORT
CHAPTER 6 MANUAL MAKING SUPPORT
CHAPTER 7 DATA TRANSFER
CHAPTER 8 REMORT OPERATION
CHAPTER 9 SETTING OF LIQUID SURFACE OF RESIN
CHAPTER 10 MOLDING ARRANGEMENT
CHAPTER 11 COATING PARAMETER SETTING
CHAPTER 12 EXPOSURE PARAMETER SETTING
CHAPTER 13 MOLDING
CHAPTER 14 REMOVAL
CHAPTER 15 WASHING AND SUPPORT REMOVAL
CHAPTER 16 SECONDARY CURING

FIG.9

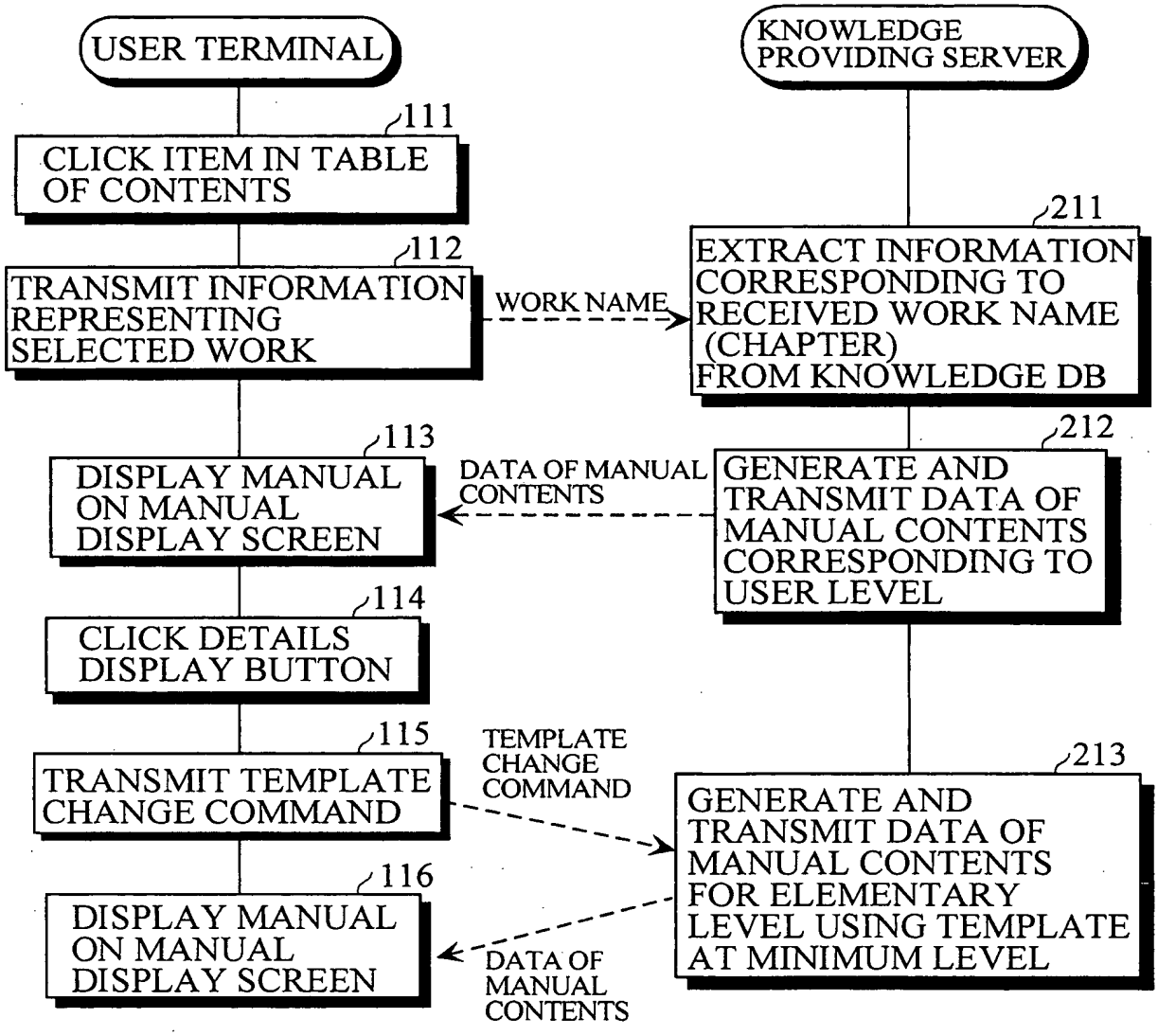
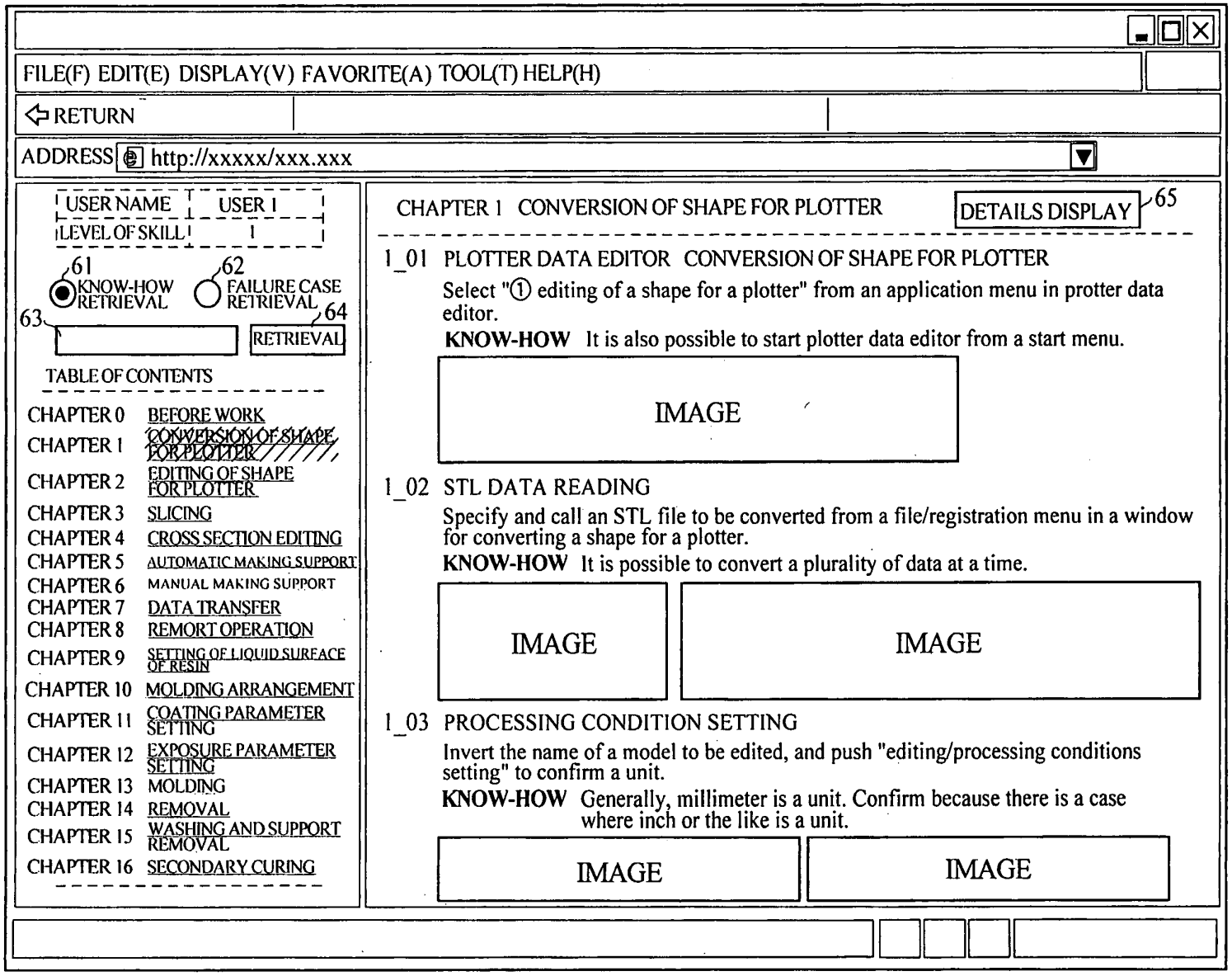

USER TERMINAL
KNOWLEDGE PROVIDING SERVER
111
CLICK ITEM IN TABLE OF CONTENTS
112
TRANSMIT INFORMATION REPRESENTING SELECTED WORK
WORK NAME
211
EXTRACT INFORMATION CORRESPONDING TO RECEIVED WORK NAME (CHAPTER) FROM KNOWLEDGE DB
113
DISPLAY MANUAL ON MANUAL DISPLAY SCREEN
DATA OF MANUAL CONTENTS
212
GENERATE AND TRANSMIT DATA OF MANUAL CONTENTS CORRESPONDING TO USER LEVEL
114
CLICK DETAILS DISPLAY BUTTON
115
TRANSMIT TEMPLATE CHANGE COMMAND
TEMPLATE CHANGE COMMAND
213
GENERATE AND TRANSMIT DATA OF MANUAL CONTENTS FOR ELEMENTARY LEVEL USING TEMPLATE AT MINIMUM LEVEL
116
DISPLAY MANUAL ON MANUAL DISPLAY SCREEN
DATA OF MANUAL CONTENTS

FIG.10


FILE(F) EDIT(E) DISPLAY(V) FAVORITE(A) TOOL(T) HELP(H)
RETURN
ADDRESS http://xxxxx/xxx.xxx
USER NAME USER 1
LEVEL OF SKILL 1
61
KNOW-HOW RETRIEVAL
62
FAILURE CASE RETRIEVAL
63
64
RETRIEVAL
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CHAPTER 6 MANUAL MAKING SUPPORT
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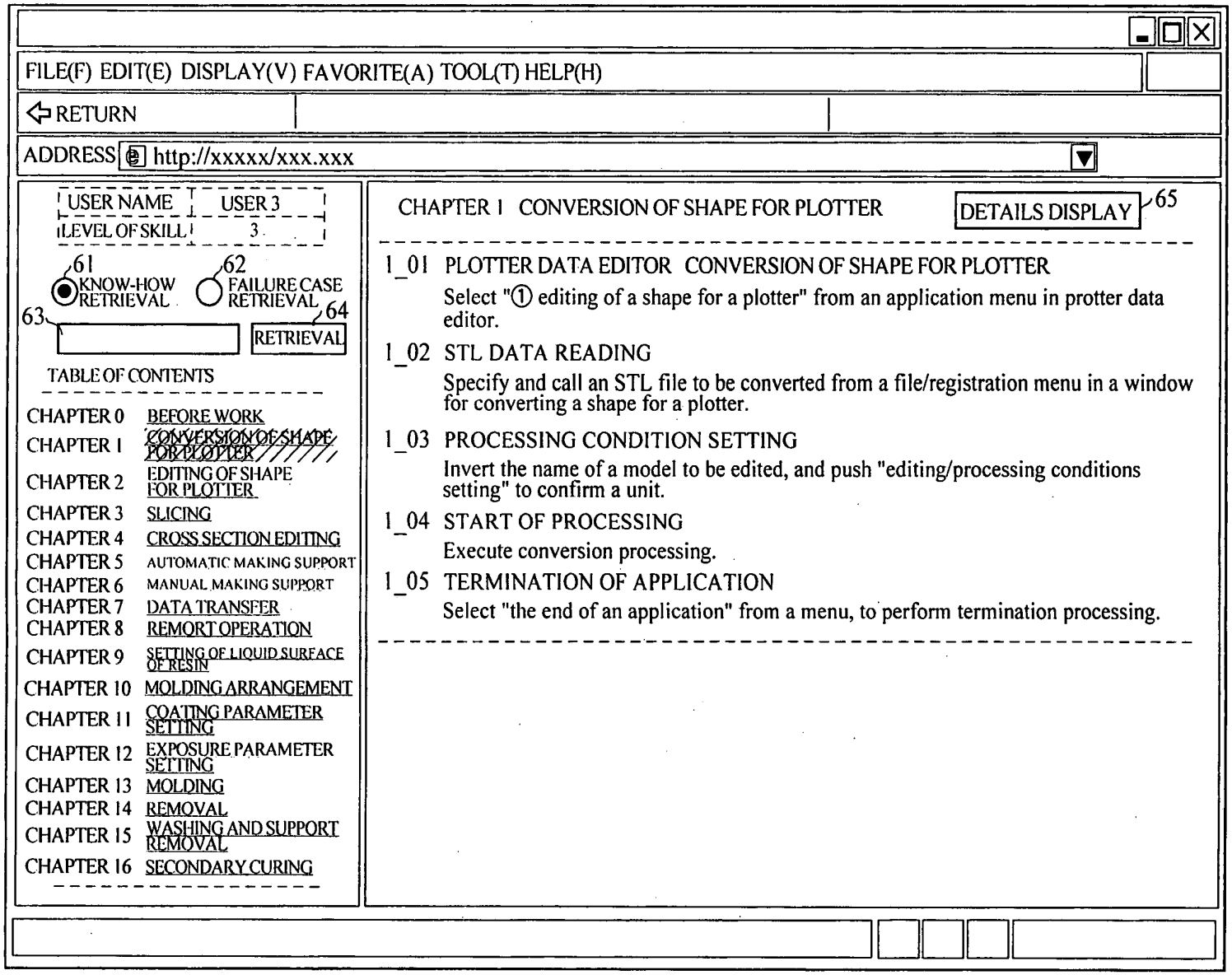
CHAPTER 11 COATING PARAMETER SETTING
CHAPTER 12 EXPOSURE PARAMETER SETTING
CHAPTER 13 MOLDING
CHAPTER 14 REMOVAL
CHAPTER 15 WASHING AND SUPPORT REMOVAL
CHAPTER 16 SECONDARY CURING
CHAPTER 1 CONVERSION OF SHAPE FOR PLOTTER
DETAILS DISPLAY
65
1_01 PLOTTER DATA EDITOR CONVERSION OF SHAPE FOR PLOTTER
Select "① editing of a shape for a plotter" from an application menu in protter data editor.
KNOW-HOW It is also possible to start plotter data editor from a start menu.
IMAGE
1_02 STL DATA READING
Specify and call an STL file to be converted from a file/registration menu in a window for converting a shape for a plotter.
KNOW-HOW It is possible to convert a plurality of data at a time.
IMAGE
IMAGE
1_03 PROCESSING CONDITION SETTING
Invert the name of a model to be edited, and push "editing/processing conditions setting" to confirm a unit.
KNOW-HOW Generally, millimeter is a unit. Confirm because there is a case where inch or the like is a unit.
IMAGE
IMAGE

FIG.11


FILE(F) EDIT(E) DISPLAY(V) FAVORITE(A) TOOL(T) HELP(H)
RETURN
ADDRESS http://xxxxx/xxx.xxx
USER NAME USER 3
LEVEL OF SKILL 3
61
KNOW-HOW RETRIEVAL
62
FAILURE CASE RETRIEVAL
63
64
RETRIEVAL
TABLE OF CONTENTS
CHAPTER 0 BEFORE WORK
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CHAPTER 2 EDITING OF SHAPE FOR PLOTTER
CHAPTER 3 SLICING
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CHAPTER 5 AUTOMATIC MAKING SUPPORT
CHAPTER 6 MANUAL MAKING SUPPORT
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CHAPTER 8 REMORT OPERATION
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CHAPTER 11 COATING PARAMETER SETTING
CHAPTER 12 EXPOSURE PARAMETER SETTING
CHAPTER 13 MOLDING
CHAPTER 14 REMOVAL
CHAPTER 15 WASHING AND SUPPORT REMOVAL
CHAPTER 16 SECONDARY CURING
CHAPTER 1 CONVERSION OF SHAPE FOR PLOTTER
DETAILS DISPLAY
65
1_01 PLOTTER DATA EDITOR CONVERSION OF SHAPE FOR PLOTTER
Select "① editing of a shape for a plotter" from an application menu in protter data editor.
1_02 STL DATA READING
Specify and call an STL file to be converted from a file/registration menu in a window for converting a shape for a plotter.
1_03 PROCESSING CONDITION SETTING
Invert the name of a model to be edited, and push "editing/processing conditions setting" to confirm a unit.
1_04 START OF PROCESSING
Execute conversion processing.
1_05 TERMINATION OF APPLICATION
Select "the end of an application" from a menu, to perform termination processing.

FIG.12

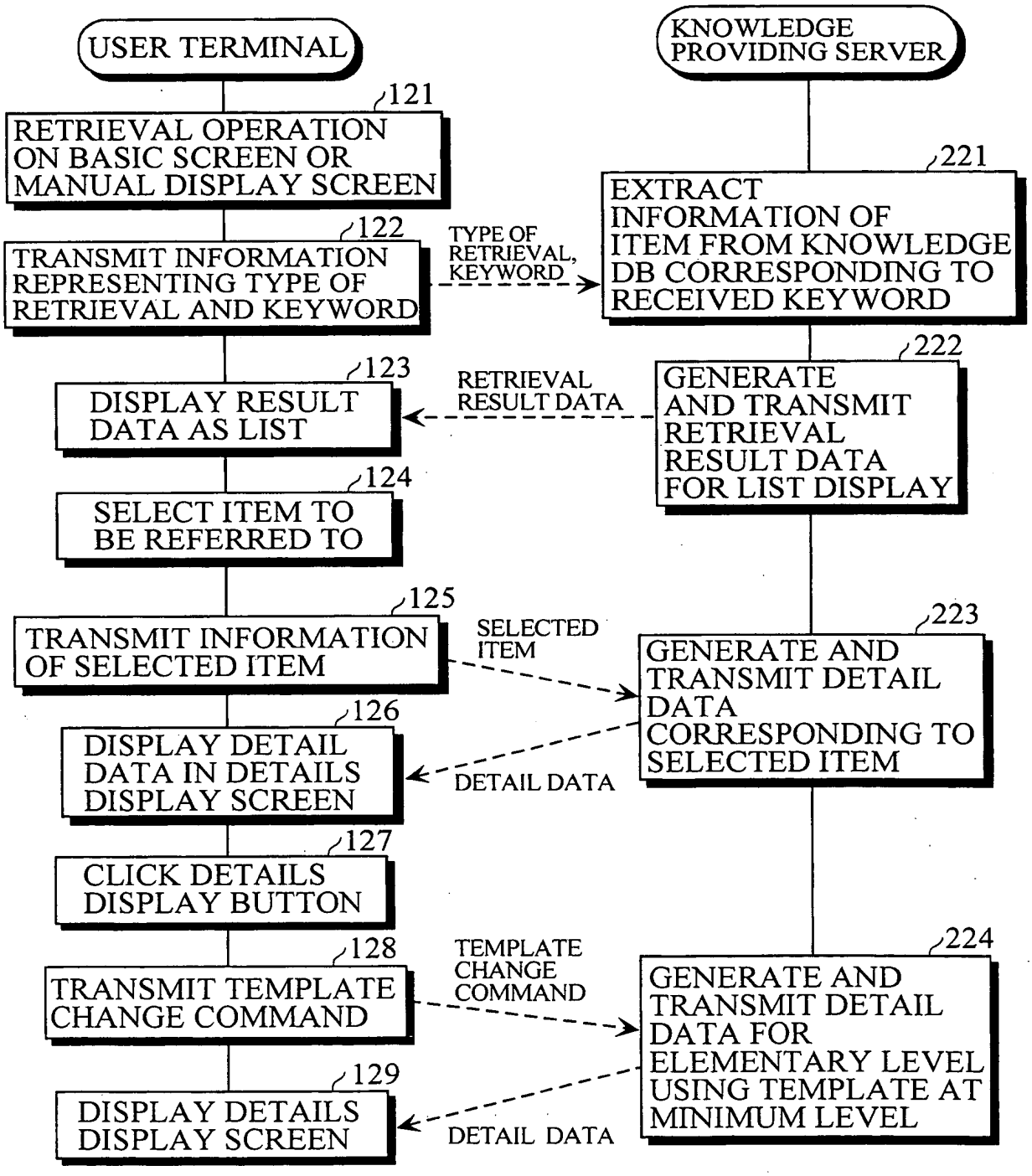

USER TERMINAL
KNOWLEDGE PROVIDING SERVER
121
RETRIEVAL OPERATION ON BASIC SCREEN OR MANUAL DISPLAY SCREEN
221
EXTRACT INFORMATION OF ITEM FROM KNOWLEDGE DB CORRESPONDING TO RECEIVED KEYWORD
122
TRANSMIT INFORMATION REPRESENTING TYPE OF RETRIEVAL AND KEYWORD
TYPE OF RETRIEVAL, KEYWORD
222
123
DISPLAY RESULT DATA AS LIST
RETRIEVAL RESULT DATA
GENERATE AND TRANSMIT RETRIEVAL RESULT DATA FOR LIST DISPLAY
124
SELECT ITEM TO BE REFERRED TO
125
TRANSMIT INFORMATION OF SELECTED ITEM
SELECTED ITEM
223
GENERATE AND TRANSMIT DETAIL DATA CORRESPONDING TO SELECTED ITEM
126
DISPLAY DETAIL DATA IN DETAILS DISPLAY SCREEN
DETAIL DATA
127
CLICK DETAILS DISPLAY BUTTON
128
TRANSMIT TEMPLATE CHANGE COMMAND
TEMPLATE CHANGE COMMAND
224
GENERATE AND TRANSMIT DETAIL DATA FOR ELEMENTARY LEVEL USING TEMPLATE AT MINIMUM LEVEL
129
DISPLAY DETAILS DISPLAY SCREEN
DETAIL DATA

FIG.13

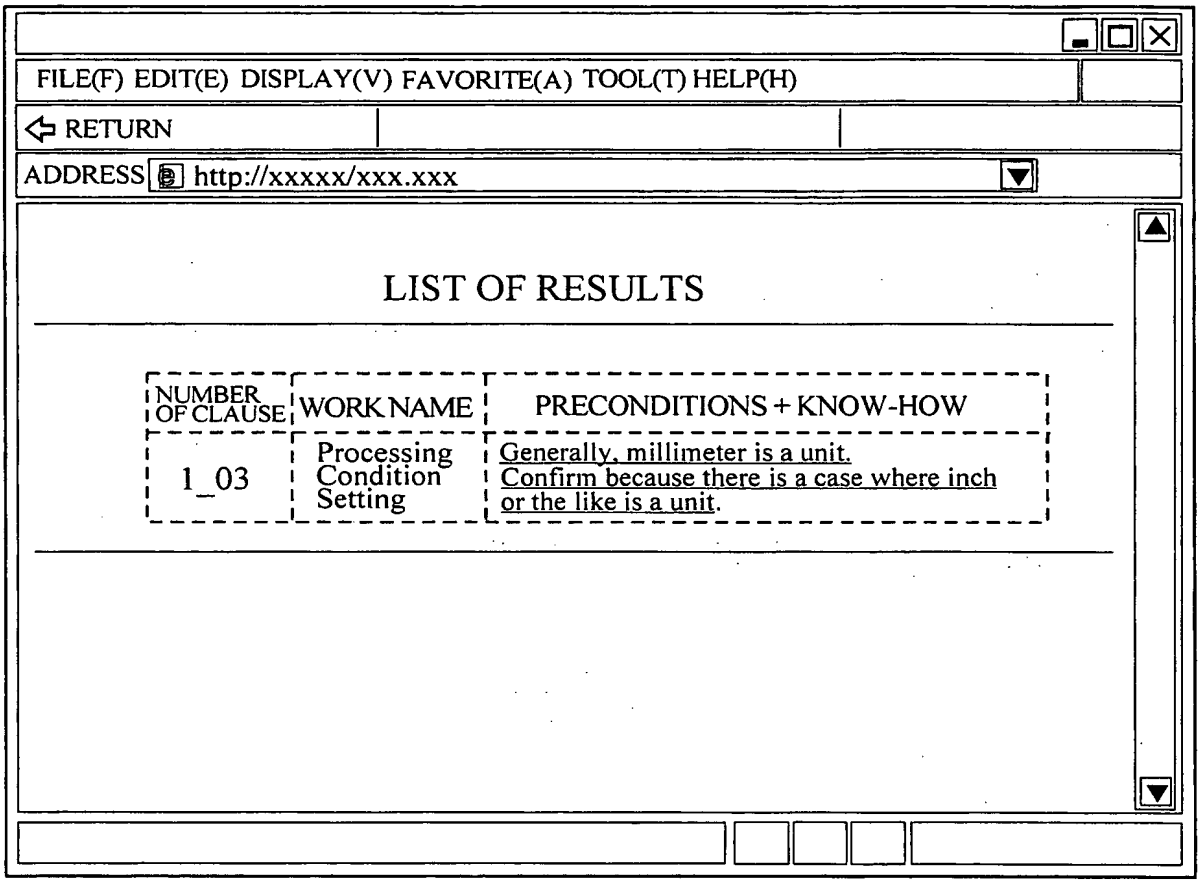

FILE(F) EDIT(E) DISPLAY(V) FAVORITE(A) TOOL(T) HELP(H)
RETURN
ADDRESS http://xxxxx/xxx.xxx
LIST OF RESULTS
NUMBER OF CLAUSE
WORK NAME
PRECONDITIONS + KNOW-HOW
1_03
Processing Condition Setting
Generally, millimeter is a unit. Confirm because there is a case where inch or the like is a unit.

FIG.14

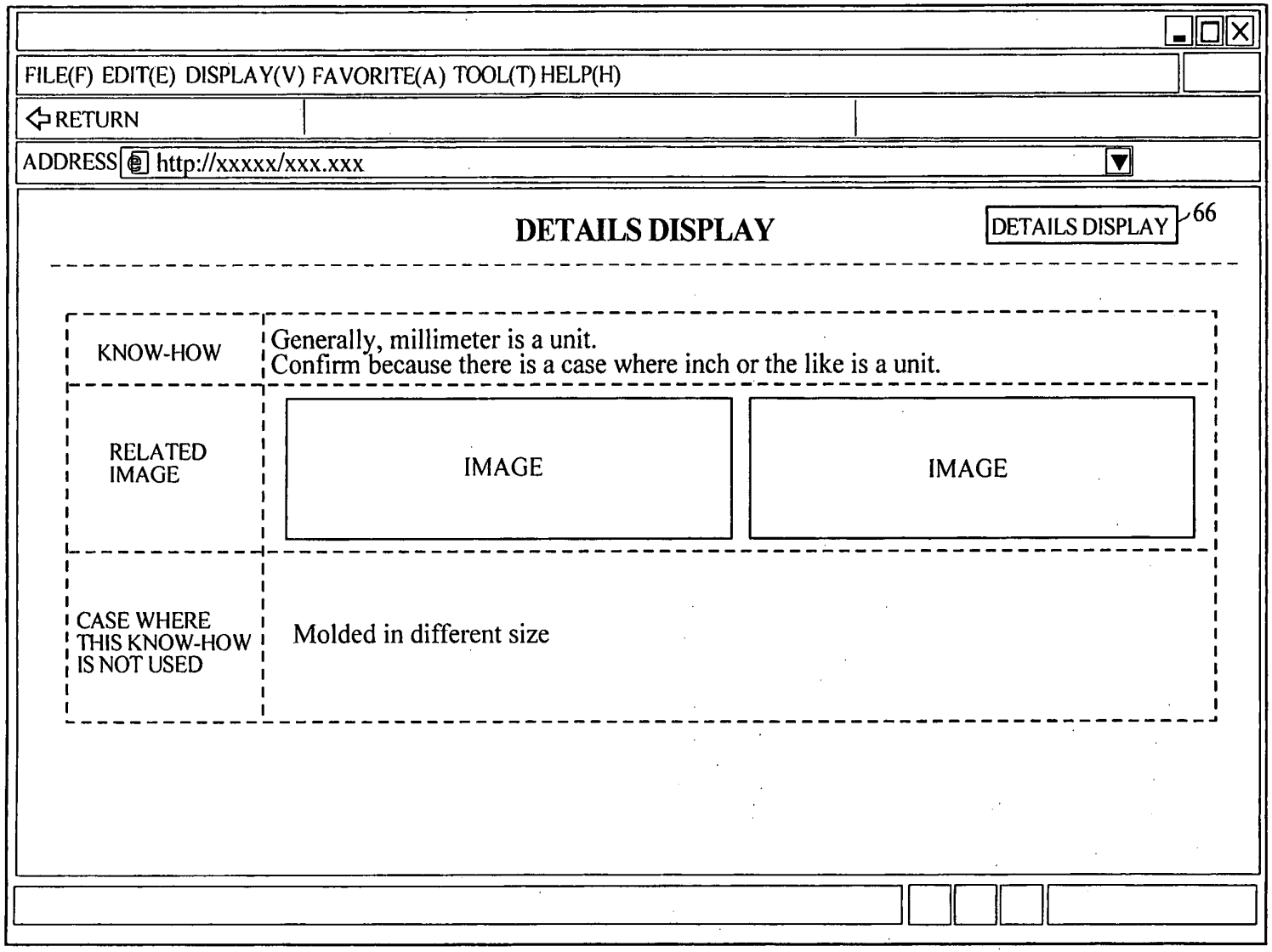

FILE(F) EDIT(E) DISPLAY(V) FAVORITE(A) TOOL(T) HELP(H)
RETURN
ADDRESS http://xxxxx/xxx.xxx
DETAILS DISPLAY
DETAILS DISPLAY
66
KNOW-HOW
Generally, millimeter is a unit.
Confirm because there is a case where inch or the like is a unit.
RELATED IMAGE
IMAGE
IMAGE
CASE WHERE THIS KNOW-HOW IS NOT USED
Molded in different size

FIG.15

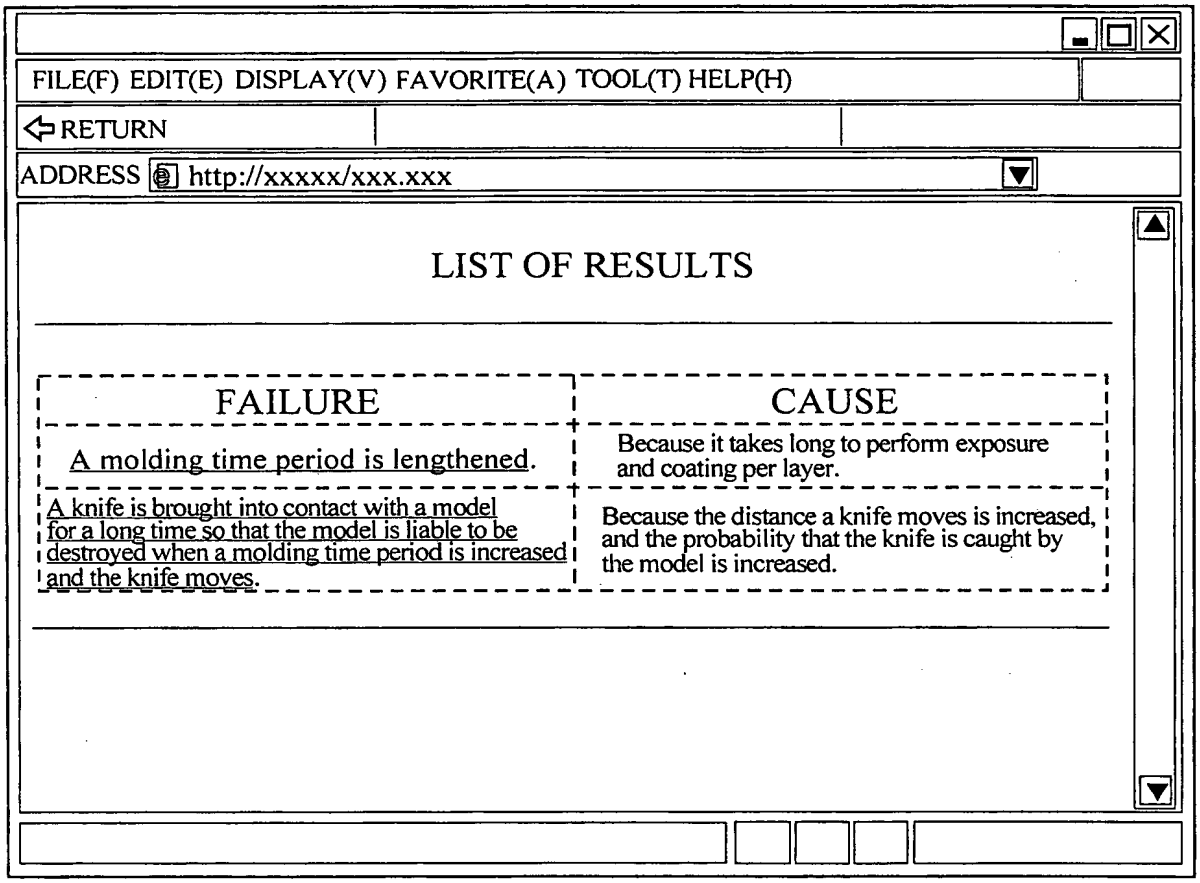

FILE(F) EDIT(E) DISPLAY(V) FAVORITE(A) TOOL(T) HELP(H)
RETURN
ADDRESS http://xxxxx/xxx.xxx
LIST OF RESULTS
FAILURE
CAUSE
A molding time period is lengthened.
Because it takes long to perform exposure and coating per layer.
A knife is brought into contact with a model for a long time so that the model is liable to be destroyed when a molding time period is increased and the knife moves.
Because the distance a knife moves is increased, and the probability that the knife is caught by the model is increased.

FIG.16

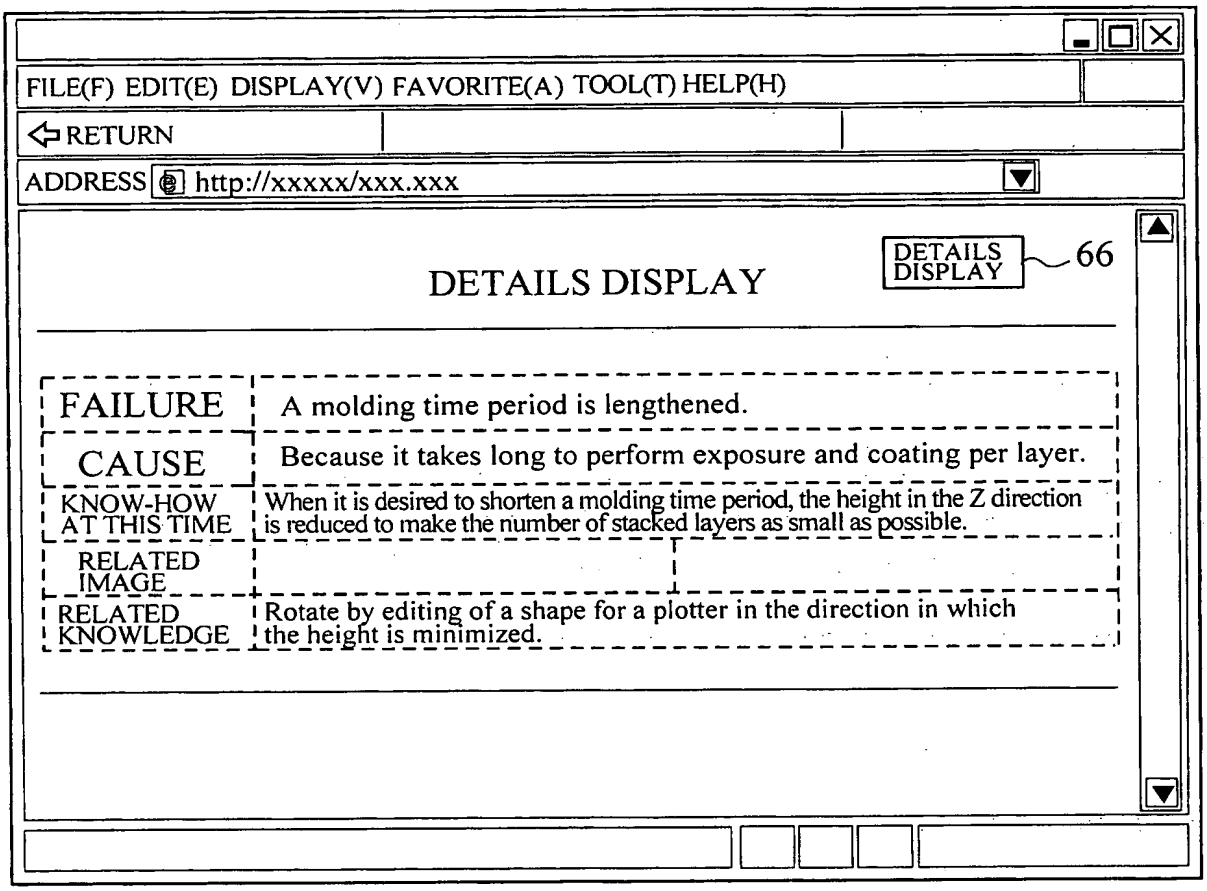
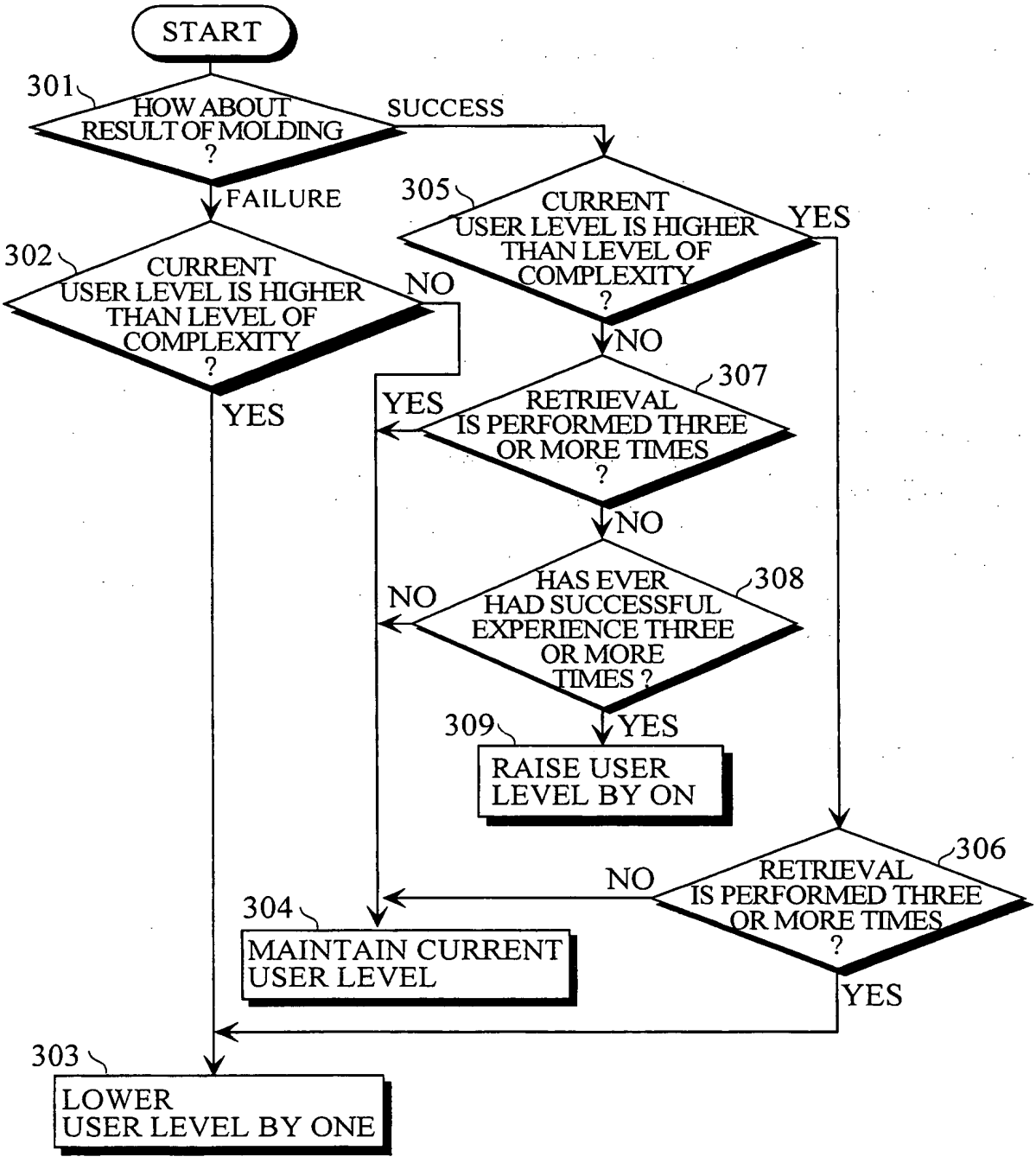

FILE(F) EDIT(E) DISPLAY(V) FAVORITE(A) TOOL(T) HELP(H)
RETURN
ADDRESS http://xxxxx/xxx.xxx
DETAILS DISPLAY
66
DETAILS DISPLAY
FAILURE
A molding time period is lengthened.
CAUSE
Because it takes long to perform exposure and coating per layer.
KNOW-HOW AT THIS TIME
When it is desired to shorten a molding time period, the height in the Z direction is reduced to make the number of stacked layers as small as possible.
RELATED IMAGE
RELATED KNOWLEDGE
Rotate by editing of a shape for a plotter in the direction in which the height is minimized.

FIG.17


START
301
HOW ABOUT RESULT OF MOLDING ?
SUCCESS
FAILURE
305
CURRENT USER LEVEL IS HIGHER THAN LEVEL OF COMPLEXITY ?
YES
NO
302
CURRENT USER LEVEL IS HIGHER THAN LEVEL OF COMPLEXITY ?
NO
YES
307
RETRIEVAL IS PERFORMED THREE OR MORE TIMES ?
YES
NO
308
HAS EVER HAD SUCCESSFUL EXPERIENCE THREE OR MORE TIMES ?
NO
YES
309
RAISE USER LEVEL BY ON
306
RETRIEVAL IS PERFORMED THREE OR MORE TIMES ?
NO
YES
304
MAINTAIN CURRENT USER LEVEL
303
LOWER USER LEVEL BY ONE